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Control Data® 9412
Windsor™ 8-Inch Fixed Disk Drive

**Designed for Original Equipment Manufacturers (OEM)**

JAN 20 1983

The Control Data 9412 Windsor Disk Drive is a fixed, 8-inch, rigid disk unit that provides 80 megabytes of unformatted storage. The 9412 is a fixed disk mate for the Lark® cartridge disk drive. It is also suited for any application requiring high performance, high capacity and the reliability of Winchester technology.

The Windsor drive is totally interface compatible with the Lark family of fixed/removable drives. The Lark Device Interface (LDI) features a two-cable design with a 40-pin command cable and a 26-pin data cable. The command cable incorporates an 8-bit bi-directional bus for command and status transfers between the LDI controller and drive. LDI can be adapted to industry standard Storage Module Drive (SMD) interface or Intelligent Standard Interface (ISI) via an optional adaptor board.

Features

- LDI interface compatible
- ISI interface compatible via adaptor board.
- SMD interface compatible via adaptor board.
- Transfer rate of 9.67 megahertz.
- Average access time of 25 milliseconds.
- Unformatted capacity of 80 megabytes.
- Quiet operation.
- Forced air, closed loop cooling system.
- Low DC power requirement.
- No AC power requirement.
- Direct drive, brushless spindle motor.
- Sealed head-disk assembly.
- Low mass, lightly loaded heads.
- Dedicated servo surface.
- Dedicated head-landing zone.
- Rotary voice-coil actuator.
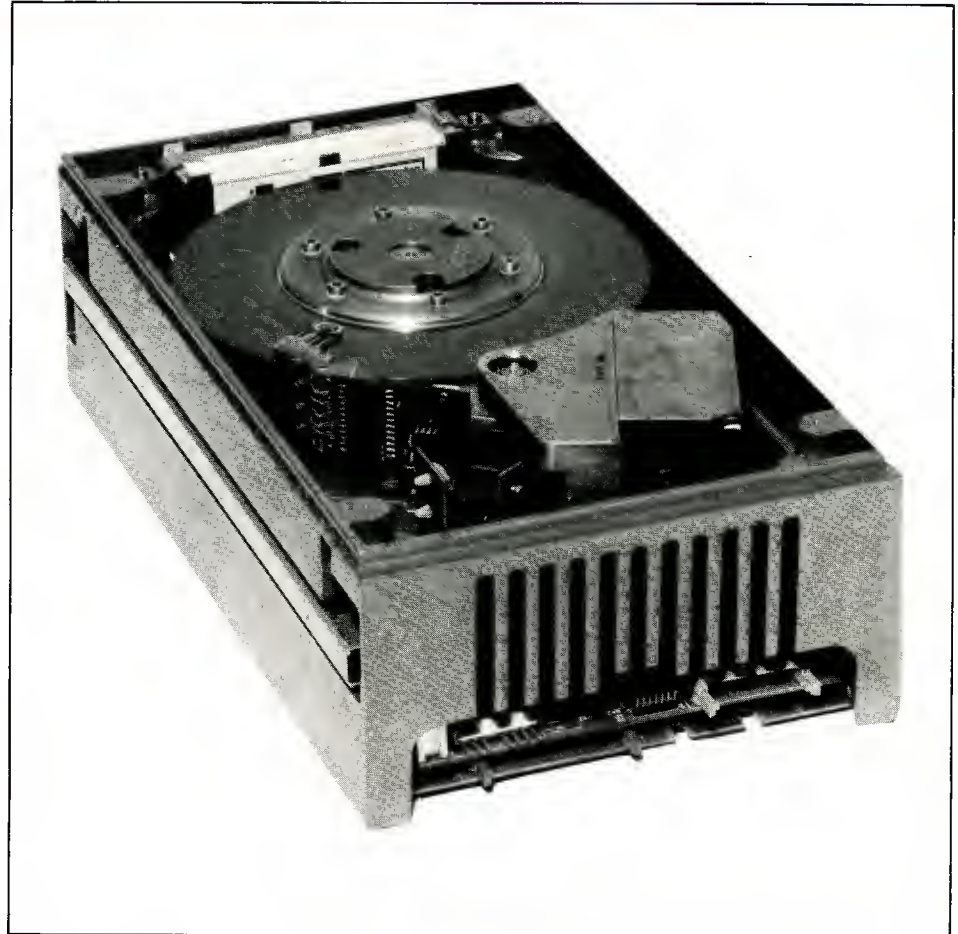
- Spindle brake.
- No adjustments or preventive maintenance required.
- Device MTBF of 10,000 hours.
- Microcomputer and LSI electronics.
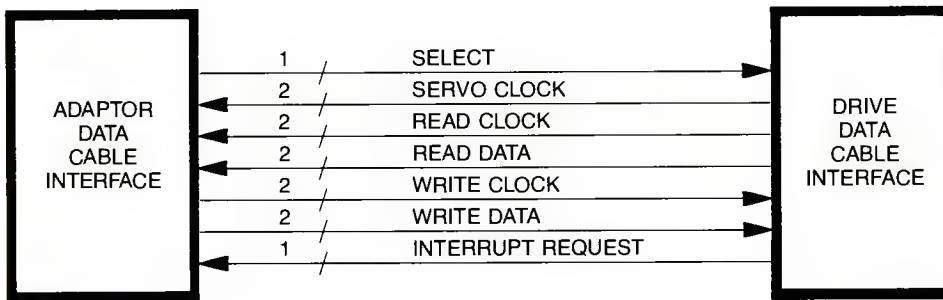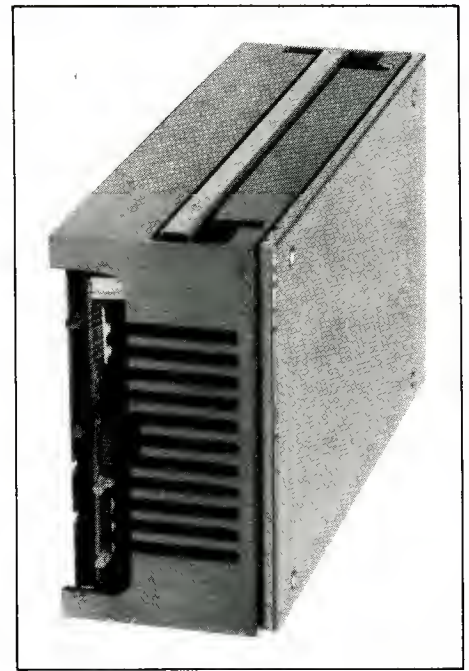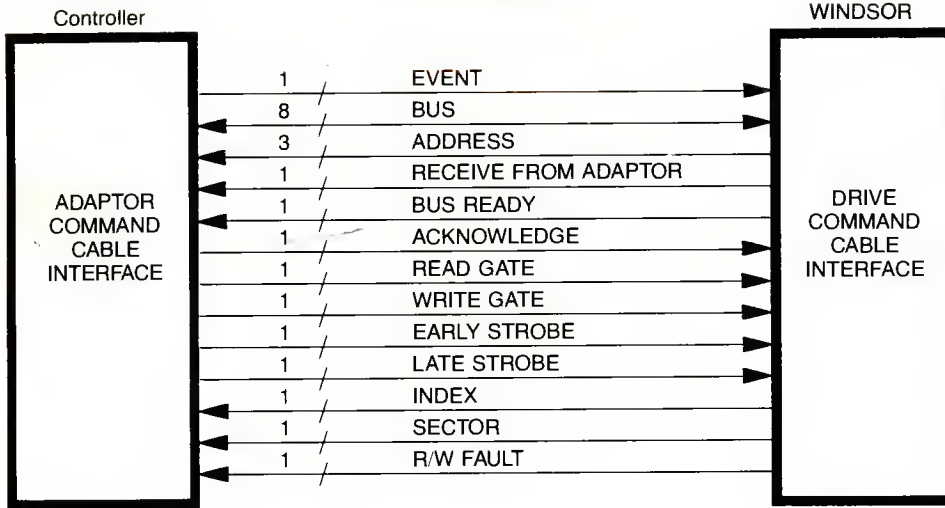- Automatic shipping lock.

Description

The Windsor drive consists of a disk assembly, spindle motor, rotary voice-coil actuator and electronic assembly. LDI interface is standard on this drive; SMD interface is available with an optional adaptor board.

The 9412 is available in fixed sector formats of 256 bytes or 512 bytes per sector; 64 or 32 sectors per track respectively.
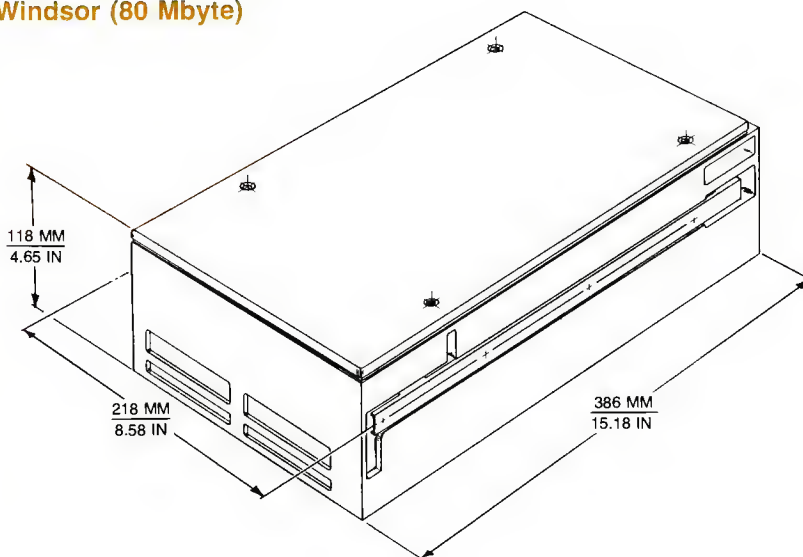
Options and Accessories

- SMD adaptor board.
- ISI adaptor board.
- Power supply with cables.
- Dual power supply module (operate Windsor and Lark drives).
- PIO module (SMD adaptor board, plus power supply).
- 9954 Field Tester.
- Base mounting kit.
- LDI cables.
- SMD cables.
- Maintenance manual.

LDI Interface

Controller		WINDSOR

ADAPTOR COMMAND CABLE INTERFACE → **DRIVE COMMAND CABLE INTERFACE**

1	EVENT
8	BUS
3	ADDRESS
1	RECEIVE FROM ADAPTOR
1	BUS READY
1	ACKNOWLEDGE
1	READ GATE
1	WRITE GATE
1	EARLY STROBE
1	LATE STROBE
1	INDEX
1	SECTOR
1	R/W FAULT

ADAPTOR DATA CABLE INTERFACE → **DRIVE DATA CABLE INTERFACE**

1	SELECT
2	SERVO CLOCK
2	READ CLOCK
2	READ DATA
2	WRITE CLOCK
2	WRITE DATA
1	INTERRUPT REQUEST

Windsor (80 Mbyte)

118 MM / 4.65 IN

218 MM / 8.58 IN

386 MM / 15.18 IN

Specifications

General

Number of Disks	3
Total Surfaces	6
Data Surfaces	5
Servo Surfaces	1
Capacity, Unformatted	80 Mbytes
Per Surface	16 Mbytes
Per Track	20,736 bytes

Performance

Data Transfer Rate	9.67 Mbits/s
Spindle Speed	3,500 r/min
Access Time	
Maximum, Full Stroke	60 ms
Average	25 ms
Maximum, One Track	8 ms

Recording

Bit Density	10,161 bits/in
Track Density	735 tracks/in
Tracks Per Surface	772 plus 12 spares
Recording Method	NRZ plus clock at interface; 2, 9 code on disk.
Positioning Method	Rotary voice-coil actuator

Reliability

MTBF (device)	10,000 hours
Service Life	5 years
Preventive Maintenance	None
Adjustments	None

Data Reliability

Recoverable Read Errors	1 in 10^{10} bits transferred, maximum.
Unrecoverable Read Errors	1 in 10^{12} bits transferred, maximum.

Power Requirements

AC	None
DC	+16.5 V ($\pm$10%), 3.4 A;
	−16.5 V ($\pm$10%), 3.4 A
	+5 V ($\pm$5%), 4 A; −5.2 V ($\pm$5%), 4.5 A

Environmental

Operating Temperature	10°C to 40°C (50°F to 104°F)
Non-Operating Temperature	−40°C to 70°C (−40°F to 158°F)
Operating Humidity	20% to 80% RH
Non-Operating Humidity	5% to 95% RH
Altitude, Sea Level Ref.	
Operating	−300 m to 2,000 m (−983 ft to 6,560 ft)
Non-Operating	−300 m to 3,000 m (−983 ft to 9,850 ft)

Physical Characteristics

Height	118 mm (4.65)
Width	218 mm (8.58)
Depth	386 mm (15.18)
Weight	10 kg (22 lb)

Specifications subject to change without notice.

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